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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,549	06/07/2001	John SantaLucia JR.	WSU 0192 PUSP	7537

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EXAMINER
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LIN, JERRY

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/876,549

Applicant(s)

SANTALUCIA ET AL.

Examiner

Jerry Lin

Art Unit

1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-21,23-41 and 43-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-21,23-41 and 43-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### **DETAILED ACTION**

Applicants' arguments, filed March 14, 2005, have been fully considered and they are not deemed to be persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-21, 23-41, and 43-60 remain rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 21, and 41 have been amended to include the limitation of "more than one individual single stranded and bimolecular complexes". It is unclear whether the complexes are required to be both single stranded and bimolecular or if the complexes may be single stranded or bimolecular. Furthermore, it is unclear what other types of molecules besides nucleic acids are referred to as "single stranded" or has hybridization thermodynamics.

In addition, in claims 1, 21, and 41, the claims recite the limitation of statistically weighting the hybridization thermodynamics. However, it is unclear from the claims how statistically weighting the hybridization thermodynamics affects the calculation of the

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hybridization thermodynamics after the calculation has already been preformed in a previous step.

Claims 1, 21 and 41 recites the limitation "species" in the last line. There is insufficient antecedent basis for this limitation in the claim. Since the instant limitation was not recited previously in the claim, it is unclear to what kind of species does the limitation refer.

Claims 3-20, 23-40, and 43-60 remain rejected for their dependence from claims 1, 21, and 41.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 3-21, 23-41, and 43-60 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Consideration of the "Computer-Related Inventions" section of the MPEP at section 2106, Part IV, subpart B, has revealed that the instant claims are directed to non-statutory subject matter without requiring performance of a result outside of a computer. Thus, the manipulation of data or conversion of data, in this case, the calculation of hybridization thermodynamics without any physical transformation outside of the computer is non-statutory. Thus the instant claims are directed to non-functional descriptive material. For example, said MPEP section also clarifies that claims such non-statutory subject matter on a computer medium or in software does not prevent this

rejection. Below is a discussion of specific limitations, which do not provide statutory subject matter, even when combined with the calculation of hybridization thermodynamics.

For example in claim 1, the instant claim recites the limitation of "outputting at least one equilibrium concentration." The instant limitation also does not result in any physical transformation outside of the computer, since outputting includes the transference of data from one component of a computer such as a hard drive to another component of a computer, such as a second hard drive.

For example in claim 21, the limitation of "a system for predicting" is interpreted to include a system of method steps. Thus the steps that begin with the phrase "a means for" are method steps that work within the system of method steps. Although the instant claim includes a database, the compilation of data is non-statutory according to the MPEP at section 2106, Part IV, subpart B.

For example in claim 41, the claim includes the limitation "a computer readable storage medium". Despite the inclusion of this limitation, the instant claim is still non-statutory. The MPEP at section 2106, Part IV, subpart B states, "When non-functional descriptive material is recorded on some computer-readable medium, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material stored in a computer-readable medium does not make is statutory." Thus this instant limitation does not provide for any physical transformation outside the computer. Given that the method steps are drawn to non-functional descriptive material, the embodiment of these method steps in

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a system, computer-readable storage medium, or some other computer means for implementing the system is non-statutory.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 5, 9-15, 18, 21, 25, 29-35, 41, 45, and 49-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange et al. (US 6,403,314) in view of Lane et al. (US 6,027,884).

Please see the previous office action for the teaching of Lange et al. and Lane et al.

Applicants have responded to this rejection by amending into claim 1, 21, and 41 the limitation of statistically weighting the hybridization thermodynamics of more than one individual single stranded and bimolecular complexes; and outputting at least one equilibrium concentration of at least one species.

The Examiner notes that Lange et al. teach calculating hybridization thermodynamics wherein the thermodynamics of more than one individual single stranded and bimolecular complexes (single stranded nucleic acid fragments or hybridized fragments) are statistically weighted by accumulating the total stability for all interactions to a fragment and each is given equal statistical weight (column 11, lines 1-36).

The Examiner also notes that Lane et al. teach outputting at least one equilibrium concentration of at least one species as in Figure 4 and its description.

Since the combination of the references teaches all the limitations and one of ordinary skill in the art would be motivated to combine these teachings for the reasons provided in the previous office action, the instant claims are rejected under 35 USC §103.

Claims 1, 6-8, 16, 17, 21, 26-28, 36, 37, 41, 46-48, 56 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange et al. (US 6,403,314) in view of Lane et al. (US 6,027,884) further in view of Barciszewski et al. (RNA Biochemistry and Biotechnology).

Please see the previous office action for teachings of Lange et al., Lane et al., and Barciszewski et al.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Lin whose telephone number is (571) 272-2561. The examiner can normally be reached on 6:30-5:00, M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel, Ph.D. can be reached on (571) 272-0718. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JL

*Ardin H. Marschel 6/13/05*  
**ARDIN H. MARSCHEL**  
**SUPERVISORY PATENT EXAMINER**